Role of intracytoplasmic pattern recognition receptors in HSC engraftment

Grant Award Details

Role of intracytoplasmic pattern recognition receptors in HSC engraftment

Grant Type: Basic Biology V

Grant Number: RB5-07379

Project Objective: The objective is to test the hypothesis that signaling through specific pattern recognition receptors (PRRs), including toll-like and nod-like receptors, interferes with the ability of HSCs to engraft and produce functional progeny.

Investigator:

Name:	Dianne McKay
Institution:	University of California, San Diego
Type:	PI

Disease Focus: Blood Disorders

Award Value: $615,639

Status: Closed

Progress Reports

Reporting Period: Year 1

View Report

Reporting Period: Year 2

View Report

Grant Application Details

Application Title: Role of intracytoplasmic pattern recognition receptors in HSC engraftment

Public Abstract:

The research performed through this project is very important for the fields of solid organ and bone marrow transplantation because it focuses on a potential new target to increase engraftment of stem cells. Currently, patients that receive stem cell transplants from a non-identical donor must take medications to suppress their immune system; otherwise the stem cells will be rejected.

Stem cell trials have been extended to solid organ transplantation, where it has been shown that kidney transplants can be managed with little or no immunosuppressive medications when stem cells are given to the patient at the time of transplantation. In many cases though the stem cells are rejected and the patient must resume toxic medications.

Our laboratory has been very interested in understanding ways to prevent the rejection of stem cells and has focused on a phylogenetically conserved group of cellular receptors called pattern recognition receptors. This project is focused on understanding how to prevent rejection of stem cells through modifications of these receptors. We hope to identify novel targets to prevent the rejection of stem cells in order to decrease the occurrence of graft versus host disease after bone marrow transplantation and also improve the opportunities for long-term transplant survival without the use of toxic immunosuppressive medications.

Statement of Benefit to California:

The research we will undertake will benefit the State of California and its residents in two major ways. First it promises to define a novel targets to prevent rejection of stem cells that are transplanted into their new host. This is very important because rejection of hematopoietic stem cells is a major impediment to successful efforts at both bone marrow and solid organ transplantation. Patients needed life-saving solid organ transplants and patients that receive bone marrow transplants from donors that are not perfectly matched to them reject their grafts unless they take powerful medications to suppress their immune system. This project is focused on finding a way to help prevent the rejection of these grafts without the need for immunosuppressive medications.

The second way the project will benefit the State of California is to provide new employment opportunities within the State at a large University that conducts biomedical research. This project will not only directly support the employment of three California citizens devoted to biomedical research, but the work it generates will support California-based biomedical science companies, California University personal and other local companies that employ California citizens that produce the reagents and the supplies used in the proposed studies.
